

Remarks

The above Amendments and these Remarks are in reply to the Office Action mailed January 28, 2005. The fee for addition of new claims is enclosed herewith. A Petition for Extension of Time to Respond is also submitted herewith, together with the appropriate fee.

I. Summary of Examiner's Rejections

Prior to the Office Action mailed January 28, 2005, Claims 1-21 were pending in the Application. In the Office Action mailed January 28, 2005, Claims 3, 4, 9 and 10 were objected to because of various informalities. Claims 4 and 5 were rejected under 35 U.S.C. 112, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claim 15 was rejected under 35 U.S.C. 102(b) as being anticipated by Moskovich (U.S. Patent No. 5,200,861). Claim 15 was also rejected under 35 U.S.C. 102(a) as being anticipated by Blei et al. (International Publication No. WO 02/080577 A1, hereafter Blei). Claims 1, 3, 4, 8, 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Moskovich in view of Jacobsen (U.S. Patent No. 5,804,919). Claims 14-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen in view of Moskovich. Claims 1, 2, 5-7, 9-12 and 16-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Blei in view of Jacobsen, and further in view of Moskovich.

II. Summary of Applicant's Amendments

The present Response amends Claims 1, 3, 5, 7, 9, 10, 14, 15, 17 and 21; cancels Claims 2, 4, 6, 16, 19 and 20, and adds new Claims 22-28, leaving for the Examiner's present consideration Claims 1, 3, 5, 7-15, 17, 18, and 21-28. Reconsideration of the Application, as amended, is respectfully requested. Applicant reserves the right to prosecute any originally presented or canceled claims in a continuing or future application.

III. Objections to the Claims

In the Office Action mailed January 28, 2005, Claims 3, 4, 9 and 10 were objected to because of various informalities. Accordingly, Claims 3, 4, 9 and 10 have been amended as shown above, to correct the informalities therein. Reconsideration thereof is respectfully requested.

IV. Rejections under 35 U.S.C. §112

In the Office Action mailed January 28, 2005, Claims 4 and 5 were rejected under 35 U.S.C. 112, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Accordingly, Claims 4 and 5 have been amended as shown above to correct any indefiniteness therein. Applicant respectfully submits that the claims, as amended, conform to the requirements of 35 U.S.C. 112, and reconsideration thereof is respectfully requested.

V. Rejections under 35 U.S.C. §102(b) and §102(a)

In the Office Action mailed January 28, 2005, Claim 15 was rejected under 35 U.S.C. 102(b) as being anticipated by Moskovich (U.S. Patent No. 5,200,861). Claim 15 was also rejected under 35 U.S.C. 102(a) as being anticipated by Blei (International Publication No. WO 02/080577 A1).

Claim 15

Claim 15 has been amended to more clearly define the embodiment therein. As amended, Claim 15 defines:

15. *(Currently Amended) A lens assembly for use in projecting a telecentric image, comprising:*

a telecentric lens assembly adapted to receive an image from an image source, and that allows an image of said image source to be projected onto a projection surface, wherein said telecentric lens assembly comprises in sequence a plano-convex field lens having a planar surface and coupled to said image source, an aspheric lens element, and a set of positively powered lens elements positioned further from the image source.

Claim 15 defines a lens assembly for use in projecting a telecentric image, comprising in sequence a plano-convex field lens having a planar surface and coupled to said image source, an aspheric lens element, and a set of positively powered lens elements positioned further from the image source. Applicant respectfully submits that these features are neither disclosed, nor suggested by the cited references. In particular, neither Moskovich nor Blei appear to disclose the particular combination of lens elements defined by Claim 15, as currently amended. A detailed discussion of the differences between the present invention and those described by Moskovich and Blei is provided below with respect to the Examiner's rejections under 35 U.S.C. §103(a).

In view of the above comments, Applicant respectfully submits that Claim 15 is neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

VI. Rejections under 35 U.S.C. §103(a) - Moskovich/Jacobsen

In the Office Action mailed January 28, 2005, Claims 1, 3, 4, 8, 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Moskovich (U.S. Patent No. 5,200,861) in view of Jacobsen (U.S. Patent No. 5,804,919). Claims 14-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen in view of Moskovich.

Claim 1

Claim 1 has been amended to more clearly define the embodiment therein. As amended, Claim 1 defines:

1. *(Currently Amended) A system for projecting an image onto a screen or display, comprising:
a cathode ray tube including a resonant microcavity phosphor and a faceplate, and capable of producing telecentric light for an image; and
a lens assembly, the lens assembly comprising in sequence:
a plano-convex field lens element positioned close to or coupled with the faceplate,*

*a negatively-powered aspheric lens element, and
a set of positively powered lens elements positioned further from the
faceplate.*

Claim 1 has been amended to more clearly define the embodiment therein. As amended, Claim 1 defines a system comprising a resonant microcavity phosphor and a faceplate, together with a telecentric lens assembly. The lens assembly comprises in sequence: a plano-convex field lens element positioned close to or coupled with the faceplate, a negatively-powered aspheric lens element, and a set of positively powered lens elements positioned further from the faceplate. Applicant respectfully submits that this combination of features are neither disclosed by, nor suggested by the cited references.

The advantages of the embodiment defined by Claim 1 include that it provides a coupling of a telecentric lens with a resonant microcavity phosphor in such a manner that the emission angles, intensity and color content can be controlled. To accomplish this, in accordance with one embodiment a plano-convex field lens element is positioned close to, or coupled with, the faceplate. The next lens element is negatively powered, and aspheric to simultaneously correct the residual field curvature and the distortion. This element is placed between the field lens and a positively powered grouping of elements. The other elements take the diverging light and create converging beams, forming a reversed uncorrected image approximately the same size as the object. An advantage of this design is that, when multiple image sources are used having different colors, only one element differs for each color. This allows for excellent optical performance while at the same time allowing for low manufacturing cost due to most of the lenses for each color being identical.

Moskovich discloses a generally-applicable lens system that provides a wide field of view, is telecentric, and has an overall short length. (Column 3, lines 4-11). To achieve these goals, the system therein includes two lens units or groups separated by an air gap. The typical properties of the two units are: 1) the first unit contains the system's aperture stop, 2) the first unit includes two meniscus elements whose concave surfaces face each other, 3) the aperture stop is located between the two meniscus elements, 4) the combined optical power of the two meniscus elements

is negative, and 5) the second unit has a positive power. In certain embodiments, the lens system has a wide field of view. In other embodiments, the lens system covers a field of view having a half angle larger than 30 degrees, and additionally, has a telecentric pupil. In all of the embodiments, the pupil located farthest from the lens is obtained by the imaging of the aperture stop by the second lens unit. (Column 3, lines 12-21).

As described above, it appears that, in Moskovich, the system uses a particular combination of lens elements. As a result of this arrangement, the aberrations of the lens elements, i.e., coma, distortion, and lateral color, are automatically minimized by the structure of the lens. It also appears that the system therein includes an aperture stop, which is necessary to achieve the stated goals, namely that the system provide a wide field of view, is telecentric, and has an overall short length.

However, as defined by Claim 1, the system therein uses a different combination of lens elements, and does not require an aperture stop. Instead, the lens assembly comprises in sequence a plano-convex field lens element positioned closer to the cathode ray tube, an aspheric lens element, and a set of positively powered lens elements positioned further from the cathode ray tube. This particular combination of lens elements eliminates the need for an aperture stop. Applicant respectfully submits that it would not have been evident to have modified the design of Moskovich to couple a telecentric lens assembly with a resonant microcavity phosphor, or to include such a combination of lens elements, since doing so would have increased the length of the Moskovich system, and made it more complex to construct, which would interfere with Moskovich's stated goals.

Jacobsen discloses a resonant microcavity display. Jacobsen is cited for disclosing the claim element of a cathode ray tube including a resonant microcavity phosphor and capable of producing telecentric light for an image. However, Applicant respectfully submits that, like Moskovich, Jacobsen similarly does not disclose the feature of a lens assembly comprising in sequential order: a spherical lens element positioned closer to the cathode ray tube, an aspheric lens element, and a set of positively powered lens elements positioned further from the cathode ray tube.

In view of the above comments, Applicant respectfully submits that Claim 1 is neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claims 3, 4, 8, 16

Claims 3, 4, 8, 16 are not addressed separately but it is respectfully submitted that these claims are allowable as depending from an allowable independent claim and further in view of the comments provided above. Applicant respectfully submits that Claims 3, 4, 8, 16 are similarly neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

It is also submitted that these claims also add their own limitations which render them patentable in their own right. Applicant reserves the right to argue these limitations should it become necessary in the future.

Claims 14 and 15

The comments provided above with respect to Claim 1 are incorporated herein by reference. Claims 14 and 15 have been amended similarly to Claim 1 to more clearly define the embodiments therein. For similar reasons as provided above with respect to Claim 1, Applicant respectfully submits that Claims 14 and 15 are likewise neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claims 16-18

Claims 14-18 are not addressed separately but it is respectfully submitted that these claims are allowable as depending from an allowable independent claim and further in view of the comments provided above. Applicant respectfully submits that Claims 14-18 are similarly neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

VII. Rejections under 35 U.S.C. §103(a) - Blei/Moskovich/Jacobsen

In the Office Action mailed January 28, 2005, Claims 1, 2, 5-7, 9-12 and 16-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Blei (International Publication No. WO 02/080577 A1) in view of Jacobsen (U.S. Patent No. 5,804,919) and further in view of Moskovich (U.S. Patent No. 5,200,861).

Claim 1

The comments provided above with respect to Claim 1 are incorporated herein by reference. Claim 1 has been amended as shown above to define that the embodiment therein include a lens assembly comprises in sequential order a spherical lens element positioned closer to the cathode ray tube, an aspheric lens element, and a set of positively powered lens elements positioned further from the cathode ray tube.

Blei discloses an arrangement for the projection of a multi-colored image into a projection surface. As disclosed therein, one optical device each is arranged in one or more of the partial beam paths of the partial color images, whose image scales differ, and each of said optical devices is generated such that, by the change in image scale of the corresponding partial color image effected by it, the image scale of said partial color image corresponds to a predetermined, common image scale. Three image-generating elements are provided for the colors green, red and blue, the optical device being arranged in the partial beam path of the image-generating element for the color green. Figure 2 of the Blei disclosure appears to show the optical device including a set of lenses, including what appears to be a negatively powered lens 40 and 41.

However, Applicant respectfully submits that Blei does not appear to disclose or suggest the coupling of a telecentric lens assembly with a resonant microcavity phosphor, or the particular combination of a lens assembly comprising in sequential order: a plano-convex field lens element positioned close to or coupled with the faceplate, a negatively-powered aspheric lens element, and a set of positively powered lens elements positioned further from the faceplate.

In view of the above comments, Applicant respectfully submits that Claim 1 is neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claims 9 and 10

The comments provided above with respect to Claim 1 are incorporated herein by reference. Claims 9 and 10 have been amended similarly to Claim 1 to more clearly define the embodiments therein. For similar reasons as provided above with respect to Claim 1, Applicant respectfully submits that Claims 9 and 10 are likewise neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

Claim 2, 5-7, 11, 12 and 16-21

Claims 2, 5-7, 11, 12 and 16-21 are not addressed separately but it is respectfully submitted that these claims are allowable as depending from an allowable independent claim and further in view of the comments provided above. Applicant respectfully submits that Claims 2, 5-7, 11, 12 and 16-21 are similarly neither anticipated by, nor obvious in view of the cited references, and reconsideration thereof is respectfully requested.

It is also submitted that these claims also add their own limitations which render them patentable in their own right. Applicant reserves the right to argue these limitations should it become necessary in the future.

VIII. Additional Amendments

Claims 22-28

Claims 22-28 have been newly added by the present Response. Applicant respectfully requests that new Claims 22-28 be included in the Application and considered therewith.

IX. Conclusion

Application No. 10/826,587
Amendment/Response Dated: June 28, 2005
Reply to Office Action dated: January 28, 2005


In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and reconsideration is respectfully requested. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

Enclosed is a PETITION FOR EXTENSION OF TIME UNDER 37 C.F.R. § 1.136 for extending the time to respond up to and including June 28, 2005.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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